TWO BOOKS ABOUT AIRPLANES.

Aeronautics: A class text.   By Edwin B. Wilson.   New York.
   John Wiley and Sons.   vi + 265 pp.
*Grundlagen der Flugtechnik: Entwerfen und Berechnung von
   Flugzeugen.*   Von Dr.-Ing. H. G. Bader.   Berlin, B. G.
   Teubner, 1920.   Mit 47 Figuren im Text.   vi + 194 pp.

The mathematical treatment of the motion of an airplane
requires a knowledge of two subjects, the dynamics of a rigid
body, and the theory of fluid motion.   The particular applica-
tion is that of a rigid body moving in any way through a gas
and supported by the reaction of the gas.   In order to get this
support, it is necessary that the body should have such a
shape that the pressure of the gas may have full play, and
that there be attached a power system which, by driving the
body through the air, shall furnish a support equal to the weight
of the body.   If the body is required to rise, additional power
is necessary to furnish an upward force to create the vertical
acceleration.   The first problem is, therefore, a consideration
of the pressures to be produced when the body is to have uni-
form motion in a horizontal straight line, and next, the
additional pressures when it is required to rise.   Moreover,
the best shape of the body for the purpose in view must be
considered.

It is a familiar observation in watching the flight through
the air of any object, such as a thin plate or a sheet of card-
board, that it rarely keeps in a fixed direction, or remains
parallel to its first position, unless some device is used for the
purpose.   Even then there will be considerable deviations.
In fact, one may almost say that, in general, the motion of a
body through a fluid is unstable, and that, in order to keep
it steady on a straight track, it is necessary to check the slight
deviations as they arise.   In other words, human agency is
required for steering such an object.   On the other hand,
careful research, both mathematical and practical, have shown
that we can often find devices which will maintain stability
within certain limits.   In the case of the airplane, investigation
of the stability of any particular type is of fundamental
importance, and this should extend not only to small devia-
tions, but also to any that are likely to arise.